

REMARKS/ARGUMENTS

Status of Claims

Claims 1-8 are pending. Claims 1 and 5-6 have been amended. Claims 7 and 8 have been added.

Overview of the Office Action

Claims 1-6 stand rejected under 35 U.S.C. §112, second paragraph as indefinite.

Claims 1-6 stand rejected under 35 U.S.C. §102(b) as anticipated by Arakawa.

Claims 1-3 and 6 stand rejected under 35 U.S.C. §102(b) as anticipated by Yasuda.

Amendments addressing Section 112 issues

The Examiner has rejected claim 1 because the term "the arranging direction " lacked antecedent basis. Claim 1 has been amended to delete this term.

The Examiner contends that "a pair of dielectric substrates ... in the arranging direction of said resonators" in claim 1 is vague and indefinite as to what constitutes resonators. Of course, the resonators are formed by the dielectric substrates. See page 4, lines 6-11. To clarify the issue raised by the Examiner, however, Claim 1 has been amended to explicitly recite that the resonators are formed in the dielectric block and sequentially located one after another along the longitudinal axis.

The Examiner has rejected Claim 5 contending that what is compared, as recited in Claim 5, is the width of slots, although only one slot is recited. Claim 5 has been suitably amended to eliminate any perceived ambiguity.

The Examiner further contends that in Claim 6, it is unclear as to how input and output sections are structurally related to the waveguide-type dielectric filter. The Examiner's attention is directed to page 4, lines 11-16, specifying that "[T]he resonators on both sides of the dielectric filter include input and output sections, respectively,...connected to a conductive pattern formed on the printed circuit board."

Additional references to the questioned structure can be found on page 5, lines 14-16 and page 6, lines 9-10 and lines 13-14. Claim 6 has been suitably amended to eliminate the Examiner's concerns.

In view of the above, withdrawal of the 35 U.S.C. §112, second paragraph, rejection of claims 1-6 is respectfully requested.

Summary of subject matter disclosed in the specification

The following descriptive details are based on the specification. They are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations which are unclaimed.

A waveguide-type dielectric filter includes a pair of elongated dielectric substrates (11, 12) which include a plurality of resonators. Adjacent resonators are coupled to each other by a throughgoing coupling hole (16) defined between the opposing surfaces of the substrates (11, 12). See Specification, paragraph bridging pages 3 and 4 and FIGs. 1-5

The elongated dielectric substrates (11, 12) extend along the longitudinal axis of the inventive filter and are joined together by respective opposing contact surfaces referred to as joint surfaces. See FIGs. 1-5. At least one of the joint surfaces is formed with a groove that, when the opposing joint surfaces of the substrates are joined together, defines the throughgoing coupling hole between adjacent resonators. Each coupling slot has its inner surface covered by a conductive film. See Specification, page 4, lines 24-27 and FIGs. 1-5.

Descriptive Summary of the Prior Art

ARAKAWA

Arakawa discloses a plurality of monolithic blocks each defining a respective resonator which has a rectangular cross-section. See column 3, lines 45-49. The resonators are joined together to define a longitudinal dielectric filter in which the joined contact surfaces of the adjacent resonators extend perpendicular to the longitudinal axis of the filter. See FIGs. 1 and 3-13. Coupling of adjacent resonators is realized by a slot

2a, 2b (FIG. 1) formed in the contact surfaces of the adjacent resonators. The peripheral surface of the slot has a window or gap (21) devoid of a conductive film and, thus, defining the interruption within the film which extends between the boundaries of the gap and respective sides of the filter. See Arakawa, col. 3, lines 49-51. The size of this gap defines an electromagnetic coupling amount, pass-band width, and other characteristics of the coupled resonators. See col. 4, lines 14-17.

YASUDA

Yasuda discloses two elongated dielectric substrates 26a, 26b having opposing surfaces which are joined together in a plane extending perpendicular to spaced, relatively short sides of a rectangularly shaped filter. Coupling slots 23a, 23b and 23c, defined between the joined surfaces, couple a plurality of $\frac{1}{4}$ wavelength transverse electromagnetic (TEM) resonators. (FIGS. 1, 2 and 4). The coupling slots each have an aperture 35 (FIGS. 4-6) which is located next to the outer surface of the relatively narrow side of the filter and devoid of a conductive film. The geometry of the apertures 35 devoid of the conductive film is important for adjusting the characteristics of the filter including, for example, a bandwidth pass.

Patentability of the Claims under 35 U.S.C. §102(b)

Claims 1-6 stand rejected under 35 U.S.C. §102(b) as anticipated by Arakawa.

Claim 1 has been amended to recite (I) a pair of dielectric substrates which are elongated parallel to the longitudinal axis and are joined together through respective joint surfaces thereof extending *parallel* to the longitudinal axis of a dielectric block, and (II) "wherein said slot has its inner surface covered by a conductive film."

I. In contrast to the recited structure, Arakawa teaches a dielectric filter with a plurality of dielectric resonators (1a and 1b, FIG. 1) which have contact surfaces extending *normal* to the longitudinal axis of the dielectric filter. See col. 4, lines 1-3, Arakawa, thus, fails to teach the elongated dielectric substrates having respective surfaces that are joined together so as to extend *parallel* to the longitudinal axis of the dielectric block, as recited in amended claim 1.

II. Arakawa also fails to teach that the slot has its inner surface covered by a conductive film, as recited in amended claim 1. Arakawa teaches that "[O]n the inner

round surfaces of the grooves 2a and 2b *excluding* portions of central gaps 21a and 21b, the conductors 3a and 3b are formed." See col. 3, lines 49-51. Having the gaps 21a and 21b free of a conductive film is important for Arakawa because "[C]haracteristics (the electromagnetic coupling amount, pass-band width, etc. between the resonators 1a and 1b) ...are determined by *the size* of the coupling window 21." See col. 4, lines 14-17.

Accordingly, Arakawa not only fails to teach the joined longitudinal joint surfaces of the substrates and the conductive film continuously extending along the entire length of the slot, as recited in amended claim 1, but this reference also fails to suggest as to how to cure these deficiencies. Therefore, claim 1 as amended is patentable over Arakawa.

Dependent claims 2-6

In view of patentability of independent claim 1 for the reasons presented above, each of dependent claims 2-6 is respectively patentable therewith over the applied prior art. In addition, each of these claims includes features which serve to even more clearly distinguish the present invention over the applied prior art.

In view of the foregoing, reconsideration and withdrawal of 35 U.S.C. §102 (b) rejection of claims 1-6 are in order.

Claims 1-3 and 6 stand rejected under 35 U.S.C. §102(b) as anticipated by Yasuda

Independent claim 1

As is discussed above, independent Claim 1, as amended, recites that the slot has its inner surface covered by a conductive film, such slot defining a coupling portion between adjacent resonators.

The Examiner asserts that Yasuda discloses "a slot 41a formed in *each* of joint surfaces 25 to provide the coupling portion between the adjacent resonators." Contrary to the Examiner's assertion, adjusting slots 41A, 41B are not the coupling slots, as recited in claim 1. The slots 41A, 41B are adjusting slots each of which is provided *within* a respective individual resonator. See Yasuda, Abstract. Consequently, the adjusting slots 41A, 41B do not provide "*the coupling portion between* the adjacent resonators" as asserted by the Examiner; these slots allow for adjusting characteristics of *each individual* resonator.

In contrast, the slot, as recited in claim 1, defines a coupling portion for adjustably coupling the adjacent resonators.

Yasuda, however, discloses throughgoing holes slots 23A, 23B, and 23C provided "to form resonant elements 24A-24C in the inside of the dielectric board 22." See Abstract, lines 9-15. However, Yasuda fails to teach that the inner surface of the coupling slot is covered by a conductive film. FIGs. 2 and 4-6 of Yasuda clearly illustrate that an aperture 35 of the coupling slots 23A, 23B, and 23C is devoid of a conductive film.

In contrast, the invention as recited in amended claim 1, discloses the slot has its inner surface covered by a conductive film. Accordingly, Claim 1 is patentable over Yasuda.

Dependent Claims 2, 3 and 6

Each of claims 2, 3 and 6 depends from claim 1 and, thus, benefits from its allowability. Withdrawal of the 35 U.S.C. §102(b) of claims 1-3 and 6 is respectfully requested.

New dependent claims 7 and 8

New dependent claim 7 recites that the joint surfaces of a pair of dielectric substrates extend substantially *perpendicular* to the broad sides of a rectangularly shaped filter, as clearly illustrated in FIGs. 1-5. In contrast, Yasuda, for example, discloses joint surfaces extending *parallel* to the broad sides.

New dependent claim 8 recites a conductive film that covers an entire outer surface of the dielectric block, as is disclosed on page 6, lines 13-15 of the specification. In contrast, Yasuda teaches that a side of a dielectric block, which is located next to an aperture (35), does not have a conductive film. (FIG. 4) Arakawa also lacks teaching of a conductive film that covers the entire surface. As shown in FIG. 1 of Arakawa, a region surrounding input and output holes are free from the conductive film.

Specification

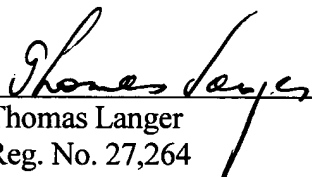
In connection with the submission of new Claim 8, the specification has been amended to explicitly recite that the joint surfaces of a pair of dielectric substrates extend substantially perpendicular to the broad sides of a rectangularly shaped filter. No new matter has been introduced since FIGs. 1 through 5 of the original disclosure unambiguously illustrate the added description.

Conclusion

Based on all of the above, it is respectfully submitted that the present application is now in proper condition for allowance. Prompt and favorable action to this effect and early passing of this application to issue are respectfully solicited.

Should the Examiner have any comments, questions, suggestions or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,
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